

AMENDMENTS TO THE SPECIFICATION

On page 1, following the title of the invention, please insert the following:

CROSS-REFERENCE TO RELATED APPLICATIONS

On page 1, please amend the first paragraph to read as follows:

This application is a continuation-in-part of prior pending Application Serial No. 09/381,838, filed on December 1, 1999, now abandoned.

BACKGROUND OF THE INVENTION

The present invention relates to luminescence assays based on transfer of excitation energy from a donor species to an acceptor species.

On page 3, at line 27, please insert a page break and, on the new page, add the following heading and paragraph:

BRIEF SUMMARY OF THE INVENTION

A method of detecting or quantifying an analyte by means of luminescence assay according to one embodiment of the present invention is based on detection of the transfer of energy between an energy donor species and an energy acceptor species as an acceptor of the energy in which the energy donor species is an up-conversion medium that affects a transition to an excited state by absorption of electromagnetic radiation having an energy less than that of the transition and is provided as a solid phase having a surface or is immobilized in a solid phase having a surface or is immobilized on a surface of a solid phase, and the acceptor species is bound to the surface of the solid phase in

Amendment Response Serial No. 10/086,213
Atty. Docket No. 16629-3 Art Unit 1641
Christopher MORGAN, Inventor
Page 2 of 23

proximity to the energy donor species, the acceptor species when so bound being excited by energy transfer from the excited state of the donor species. The specific method steps for this embodiment of the present invention include the steps of combining a sample potentially containing the analyte with the energy donor species and the acceptor species or a precursor thereof that is converted by the analyte to the acceptor species, irradiating the donor species with electromagnetic radiation to excite the donor species to its excited state for the energy transfer between the excited donor species and the acceptor species bound to the surface, and detecting luminescence in at least one spectral region of the emission of the donor species or of the acceptor if the acceptor is luminescent, provided that the excitation of the luminescent acceptor to a luminescent state emitting in the spectral region of the emission of the acceptor does not occur by absorption of a single quantum of the radiation used to excite the donor species.

On page 3, at line 30, please insert a page break and, on the new page, add the following heading and description of the figures:

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Fig. 1 schematically illustrates (not to scale) an up-conversion phosphor involved in analyte mediated binding of a fluorescent dye as acceptor species in accordance with the first preferred embodiment of the invention.

Fig. 2 illustrates the emission from a Ytterbium-sensitised Erbium-doped up-conversion phosphor.

Amendment Response Serial No. 10/086,213
Atty. Docket No. 16629-3 Art Unit 1641
Christopher MORGAN, Inventor
Page 3 of 23

Fig. 3 illustrates the situation where the donor species has independent emission transitions which are differently affected by energy transfer to an acceptor species;

Fig. 4 schematically illustrates assays in accordance with the second preferred embodiment of the invention; and

Fig. 5 is a schematic diagram representing a configuration of apparatus for detecting upconverted luminescence.

On page 3, at line 33, please insert a page break and, on the new page, add the following heading:

DETAILED DESCRIPTION OF THE INVENTION

On page 27, please delete the last three paragraphs.

On page 28, please delete the first three paragraphs.

On page 44, please delete the existing two paragraphs of Abstract and replace those two deleted paragraphs with the following Abstract, which is set forth on a separate page as required (37 CFR 1.72):

Amendment Response Serial No. 10/086,213
Atty. Docket No. 16629-3 Art Unit 1641
Christopher MORGAN, Inventor
Page 4 of 23